APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,248	04/11/2001	Robert Hundt	10005461-1	3718

7590   11/13/2003

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EXAMINER
INGBERG, TODD D

ART UNIT	PAPER NUMBER
2124	3

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/833,248	HUNDT ET AL.
	Examiner	Art Unit
	Todd Ingberg	2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _11 April 2001_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-15_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-15_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _11 April 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)
since a specific reference was included in the first sentence of the specification or in an Application Data Sheet.
37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific
reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claims 1 – 15 have been examined.

Information Disclosure Statement

1. The information disclosure statement filed September 17, 2001 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the references are missing. Please, resubmit the IDS.

Drawings

2. Drawings are accepted by Examiner for examination. Approval may change during prosecution depending on the claim limitations and the limitations shown in the drawings.

Specification

3. The Examiner has performed a "red pen" amendment to the Specification on page 5 the "*****" has been replaced by 09/833,249.

Interpretations

4. The following are the interpretations of the Examiner during the prosecution of the case.

a. **Functions** – The Specification states they comprise of an entry point and an endpoint. The Examiner notes this reads on the definition of a "Basic Block".

b. **Instrumentation code** – the Specification describes this as what is commonly known as the ability to profile. However, many techniques for enabling profiling exist the use of adding pointers to instrumentation routines is the implementation.

c. ***"encountering the branch instruction"*** – is the call of a basic block.

d. **Substitute Version** – running a module other than the original basic block or running an altered basic block.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999

(AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002

do not apply when the reference is a U.S. patent resulting directly or indirectly from an

international application **filed before November 29, 2000**. Therefore, the prior art date of the

reference is determined under **35 U.S.C. 102(e) prior to the amendment by the AIPA** (pre-

AIPA 35 U.S.C. 102(e)).

Claims 1 – 15 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN #

6,189,141 **Benitez** et al.

The applied reference has a common Assignee (HP) with the instant application. Based

upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

102(e).

	Benitez et al.	**09/833,248**
Filed Date	May 4, 1998	April 11, 2001
Issued Date	February 13, 2001	

Benitez filed before November 29, 2000.

Claim 1

Benitez anticipates a computer-implemented method for dynamic instrumentation of an executable application program (**Benitez,** Abstract – runtime based on dynamic evaluation of control flow) using an instrumentation program (**Benitez,** ability to instrument code to determine dynamically HOT and COLD activity) the application program including a plurality of original functions (**Benitez,** by computer executable programs inherently have "basic blocks", This term is the term Benitez has adapted the term "Hot Block" to – col 2, lines 55 - 60), each original function having an entry point and an endpoint (**Benitez** – inherent for a basic block to have a start and end – col 55 – 64), comprising: creating a shared memory segment for the instrumentation program and the application program (**Benitez** – col 19, lines 35 – 40 – ability to remove blocks when they get cold – also note figure 9 as noted below) ; upon initial invocation of the original functions in the application program (**Benitez** – col 19, lines 35 – 40 – ability to remove blocks when they get cold – also note figure 9 as noted below) , creating in the shared memory segment corresponding substitute functions including instrumentation code (**Benitez** – col 19, lines 35 – 40 – ability to remove blocks when they get cold – also note figure 9 as noted below) ; and executing the substitute functions (**Benitez** – Figure 9 shows the instrumented blocks such as #224 – 930 to 932) in lieu of the original functions in the application program (Benitez – running the instrumented block).

Claim 2

The method of claim 1, further comprising: patching the function entry points with breakpoint instructions; and creating the substitute functions upon encountering the breakpoint instructions.

(**Benitez**, the "trace" placed in the block as stated col 2 lines 53 – 55 – this adds the

instrumentation to the block after the trace is added the block is considered a substitute function)

Claim 3

The method of claim 2, further comprising replacing the break instruction at the entry points of

the functions in the application program with branch instructions that target the substitute

functions. (**Benitez**, col 2 lines 60 – 65, the "arc" is a jump (JMP) instruction which is a branch)

Claim 4

The method of claim 3, wherein the executable application program includes one or more branch

instructions having target addresses that reference entry points of one or more of the original

functions, further comprising: after creating a substitute function corresponding to an original

function, for a branch instruction that references the original function replacing the target

addresses to reference the substitute function. (**Benitez**, col 2 lines 60 – 65, the "arc" is a JMP

from block to block – claim 1 and 2 above cover the blocks having been instrumented – Another

interpretation of the claim language is that the Optimizer orders the blocks which could be called

a substitute function see col 32 lines 1 – 10 the dynamically optimizes intermediate

representation is the order of the basic blocks also called the DAG.)

Claim 5

The method of claim 1, wherein the executable application program includes one or more branch

instructions having target addresses that reference entry points of one or more of the original

functions, further comprising: after creating a substitute function corresponding to an original

function, for a branch instruction that references the original function replacing the target

addresses to reference the substitute function. (**Benitez**, col 2 lines 60 – 65, the "arc" is a JMP

from block to block – claim 1 and 2 above cover the blocks having been instrumented – Another

interpretation of the claim language is that the Optimizer orders the blocks which could be called

a substitute function see col 32 lines 1 – 10 the dynamically optimizes intermediate

representation is the order of the basic blocks also called the DAG.).

Claim 6

The method of claim 1, further comprising: copying a segment of the executable application

program to selected area of memory by the instrumentation program; replacing the segment of

the application program with code that allocates the shared memory by the instrumentation

program; executing the code in the application program that allocates the shared memory

segment; and restoring the segment of the executable application from the selected area of

memory to the application program by the instrumentation program after the shared memory is

allocated. (**Benitez,** col 12, lines 20 – 50 also see col 34 the "Hot Trace Memory Manager").

Claim 7

The method of claim 6, further comprising: patching the function entry points with breakpoint

instructions; and creating the substitute functions upon encountering the breakpoint instructions.

(**Benitez,** as per the rejection for claim 2 and claim 3).

Claim 8

The method of claim 7, further comprising replacing the break instruction at the entry points of

the functions in the application program with branch instructions that target the substitute

functions. (**Benitez,** as per the rejection for claim 2 and claim 3).

Claim 9

The method of claim 8, wherein the executable application program includes one or more branch instructions having target addresses that reference entry points of one or more of the original functions, further comprising: after creating a substitute function corresponding to an original function, for a branch instruction that references the original function replacing the target addresses to reference the substitute function. (**Benitez,** as per the rejection for claim 2 , claim 3 and claim 6).

Claim 10

The method of claim 6, wherein the executable application program includes one or more branch instructions having target addresses that reference entry points of one or more of the original functions, further comprising: after creating a substitute function corresponding to an original function, for a branch instruction that references the original function replacing the target addresses to reference the substitute function. (**Benitez,** as per the rejection for claim 2 , claim 3 and claim 6).

Claim 11

The method of claim 6, wherein the executable application program includes a plurality of threads and further comprising: before the step of copying the segment of the executable application program suspending all threads of the executable application program, and selecting one of the suspended threads; and after replacing the segment of the executable application program with the code that allocates the shared memory, resuming execution of the one of the suspended threads at the code that allocates the shared memory. (**Benitez,** as per the rejection for claim 2 , claim 3 and claim 6).

Claim 12

The method of claim 11, further comprising: patching the function entry points with breakpoint instructions; and creating the substitute functions upon encountering the breakpoint instructions. (**Benitez,** as per the rejection for claim 2 , claim 3 and claim 6).

Claim 13

The method of claim 12, further comprising replacing the break instruction at the entry points of the functions in the application program with branch instructions that target the substitute functions. (**Benitez,** as per the rejection for claim 2 and claim 3).

Claim 14

The method of claim 13, wherein the executable application program includes one or more branch instructions having target addresses that reference entry points of one or more of the original functions, further comprising: after creating a substitute function corresponding to an original function, for a branch instruction that references the original function replacing the target addresses to reference the substitute function. (**Benitez,** as per the rejection for claim 2 , claim 3 and claim 6).

Claim 15

Benitez anticipates an apparatus for dynamic instrumentation of an executable application program (**Benitez,** Abstract – runtime based on dynamic evaluation of control flow) by an instrumentation program (**Benitez,** ability to instrument code to determine dynamically HOT and COLD activity), the application program including a plurality of original functions (**Benitez,** by computer executable programs inherently have "basic blocks", This term is the term Benitez has adapted the term "Hot Block" to – col 2, lines 55 - 60), each original function having an entry point and an endpoint (**Benitez** – inherent for a basic block to have a start and end – col 55 – 64),

comprising: means for creating a shared memory segment for the instrumentation program

(**Benitez** – col 19, lines 35 – 40 – ability to remove blocks when they get cold – also note figure

9 as noted below) and the application program (**Benitez** – Figure 9 shows the instrumented

blocks such as #224 – 930 to 932); means for creating in the shared memory segment

corresponding substitute functions including instrumentation code upon initial invocation of the

original functions in the application program (**Benitez** – Figure 9 and ability to fetch anc load in

and out as taught by determinations of COLD and HOT ,col 19, lines 35 – 40); and means for

executing the substitute functions in lieu of the original functions in the application program

(**Benitez** – running the instrumented block).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Non Patent Literature

a. IBM Technical Disclosure Bulletin vol. 31, no 1, June 1988 – Teaches the grossly old and well

known method of using jump tables to have pointers in code substitute/ replace portions of code

or whole modules. Jump tables track the alterations to the pointers.

disclosure.

Patent Literature

a. USPN 5,212,794 – Pettis et al – Filed June 1, 1990 is one of the oldest patents on analyzing

computer programs, building a directed acyclic graph (DAG). Determining runtime information

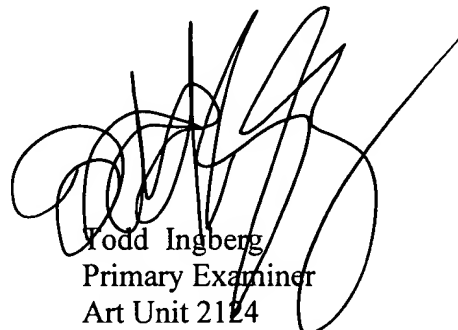about the program and then reorganizing the order of the basic blocks in an effort to optimize the

program.

b. USPN 5,613,118 – Heisch et al – Filed June 20, 1994 Teaches instrumenting programs and

reordering the call path.

c. USPN 5,774,724 - Heisch – Filed November 20, 1995 Teaches monitoring program execution

and determine frequency of execution of portions of code.

d. USPN 6,006,033 – Heisch – Filed August 15, 1994 Teaches restructuring programs based on

execution profiling.

Correspondence Information

5.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Todd Ingberg whose telephone number is (703) 305-9775. The

examiner can normally be reached on Monday - Thursday 6:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kakali Chaki can be reached on (703) 305-9662. The fax phone number for the

organization where this application or proceeding is assigned is (703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305-9700.

/Todd Ingberg/
Primary Examiner
Art Unit 2124

November 9, 2003